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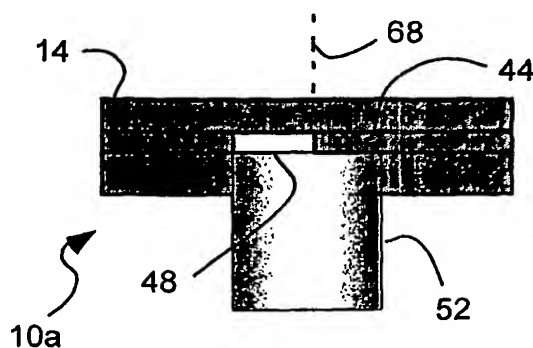
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(54) Title: **ROTARY CENTRIFUGAL AND VISCOUS PUMPS**



(57) Abstract: A pump device (10a, 10b, 10c) includes means for both transferring rotational momentum to the fluid by viscous forces, and imparting centrifugal forces to the fluid. The pump (10a, 10b) can include a wiper (44) extending partially across at least one rotatable disc surface (48, 48b, 48c) of at least one rotatable disc (52, 52b, 52c). The pump (10c) can include a rotatable shaft (150) with a hollow cavity (154) extending from one end to at least one slot (158) extending radially from the hollow cavity.

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